AMENDMENTS

In the Claims

Please amend the claims as follows:

1. (previously presented) A method of carrying out a combustion process, comprising:

initiating a combustion reaction of a combustion material;

stimulating one or more components of the combustion material using nuclear resonance to alter the oxidation of one or more selected components of the combustion reaction, the nuclear resonance stimulation having a frequency targeted for the one or more selected components;

sensing one or more operating parameters of the combustion reaction; and

adjusting the frequency of the nuclear resonance stimulation based on sensed operating parameters.

2. (original) The method of Claim 1 wherein said stimulating utilizes nuclear magnetic resonance.

3. (original) The method of Claim 1 wherein said stimulating utilizes nuclear quadrupole resonance.

4. (withdrawn) The method of Claim 1 wherein said stimulating stimulates the one or more components of the combustion material after the combustion reaction in an exhaust stream.

5. (original) The method of Claim 1 wherein said stimulating stimulates the one or more components of the combustion material during the combustion reaction in the combustion chamber.

6. (original) The method of Claim 1 wherein said stimulating stimulates the one or more components of the combustion material before the combustion reaction in an intake.

7. (original) The method of Claim 1 wherein said stimulating stimulates a first component of the combustion material in an intake to the combustion chamber with nuclear magnetic resonance and stimulates a second component of the combustion material in the combustion chamber with nuclear quadrupole resonance.

8. (original) The method of Claim 1 wherein said stimulating emits an electromagnetic signal having a frequency which targets a nuclear resonance frequency of nitrogen-14 in the combustion material.

9. (original) The method of Claim 1 wherein said stimulating emits an electromagnetic signal having a frequency which targets a nuclear resonance frequency of hydrogen-1 in the combustion material.

10. (original) The method of Claim 1 wherein said stimulating emits an electromagnetic pulse which is synchronized with said initiating of the combustion reaction.

11. (canceled)

12. (previously presented) The method of Claim 1 wherein:
said sensing provides information on one or more gas levels in an exhaust stream; and
said adjusting tunes the frequency based on the gas level information.

13. (previously presented) The method of Claim 1 wherein:
said sensing provides information on temperature in an exhaust stream; and
said adjusting tunes the frequency based on the temperature information.

14. (previously presented) The method of Claim 1 wherein said adjusting tunes the frequency based on a comparison of at least one current operating parameter to a previously-recorded operating parameter.

15. (original) A method of carrying out a combustion process, comprising:

introducing a combustion material into a combustion chamber through an intake;

initiating a combustion reaction of the combustion material in the combustion chamber; and

before said initiating, stimulating one or more components of the combustion material while in the intake using nuclear magnetic resonance to increase the oxidation of one or more selected components of the combustion reaction, wherein said stimulating occurs sufficiently close to the combustion chamber such that travel time of the stimulated combustion material is less than a resonance relaxation time of the one or more selected components.

16. (original) The method of Claim 15 wherein said stimulating emits an electromagnetic signal having a frequency which targets a nuclear resonance frequency of hydrogen-1 in the combustion material.

17. (original) The method of Claim 15 wherein said stimulating emits an electromagnetic pulse which is synchronized with said initiating of the combustion reaction.

18. (original) The method of Claim 15 further comprising:

sensing one or more operating parameters of the combustion reaction; and

adjusting the nuclear magnetic resonance stimulation based on sensed operating parameters.

19. (original) A method of carrying out a combustion process, comprising:

introducing a combustion material into a combustion chamber;

initiating a combustion reaction of the combustion material in the combustion chamber; and

during the combustion reaction, stimulating one or more components of the combustion material while in the combustion chamber using nuclear quadrupole resonance to reduce the oxidation of one or more selected components of the combustion reaction.

20. (original) The method of Claim 19 wherein said stimulating emits an electromagnetic signal having a frequency which targets a nuclear resonance frequency of nitrogen-14 in the combustion material.

21. (original) The method of Claim 19 wherein said stimulating emits an electromagnetic pulse which is synchronized with said initiating of the combustion reaction.

22. (original) The method of Claim 19 further comprising:

sensing one or more operating parameters of the combustion reaction; and

adjusting the nuclear quadrupole resonance stimulation based on sensed operating parameters.

23. (withdrawn) A method of carrying out a combustion process, comprising:

introducing a combustion material into a combustion chamber;

initiating a combustion reaction of the combustion material in the combustion chamber; and

after the combustion reaction, stimulating one or more components of the combustion material in an exhaust stream using nuclear quadrupole resonance to reduce the oxidation of one or more selected components of the combustion reaction.

24. (withdrawn) The method of Claim 23 wherein said stimulating emits an electromagnetic signal having a frequency which targets a nuclear resonance frequency of nitrogen-14 in the combustion material.

25. (withdrawn) The method of Claim 23 wherein said stimulating emits an electromagnetic pulse which is synchronized with said initiating of the combustion reaction.

26. (withdrawn) The method of Claim 23 further comprising:

sensing one or more operating parameters of the combustion reaction; and

adjusting the nuclear quadrupole resonance stimulation based on sensed operating parameters.

27. (previously presented) A combustion apparatus comprising:

a combustion chamber for containing a combustion reaction;

an intake for feeding a combustion material into said combustion chamber;

an exhaust port for carrying an exhaust stream away from said combustion chamber;

a nuclear resonance stimulation source which stimulates one or more components of the combustion material to alter the oxidation of one or more selected components of the combustion reaction, said nuclear resonance stimulation source having a frequency targeted for the one or more selected components;

at least one sensor which senses one or more operating parameters of the combustion reaction; and

a feedback control unit which adjusts the frequency of said nuclear resonance stimulation source based on sensed operating parameters.

28. (original) The combustion apparatus of Claim 27 wherein said nuclear resonance stimulation source is a nuclear magnetic resonance source.

29. (original) The combustion apparatus of Claim 27 wherein said nuclear resonance stimulation source is a nuclear quadrupole resonance source.

30. (withdrawn) The combustion apparatus of Claim 27 wherein said nuclear resonance stimulation source stimulates the one or more components of the combustion material after the combustion reaction in the exhaust stream.

31. (original) The combustion apparatus of Claim 27 wherein said nuclear resonance stimulation source stimulates the one or more components of the combustion material during the combustion reaction in said combustion chamber.

32. (original) The combustion apparatus of Claim 27 wherein said nuclear resonance stimulation source stimulates the one or more components of the combustion material before the combustion reaction in said intake.

33. (original) The combustion apparatus of Claim 27 wherein said nuclear resonance stimulation source includes a nuclear magnetic resonance source which stimulates a first component of the combustion material in said intake and a nuclear quadrupole resonance source which stimulates a second component of the combustion material in said combustion chamber.

34. (original) The combustion apparatus of Claim 27 wherein said nuclear resonance stimulation source emits an electromagnetic signal having a frequency which targets a nuclear resonance frequency of nitrogen-14 in the combustion material.

35. (original) The combustion apparatus of Claim 27 wherein said nuclear resonance stimulation source emits an electromagnetic signal having a frequency which targets a nuclear resonance frequency of hydrogen-1 in the combustion material.

36. (original) The combustion apparatus of Claim 27 wherein said nuclear resonance stimulation source emits an electromagnetic pulse which is synchronized with the combustion reaction.

37. (original) The combustion apparatus of Claim 27, further comprising electromagnetic shielding inside combustion chamber which reflects radio frequency signals toward the combustion reaction.

38. (canceled)

39. (previously presented) The combustion apparatus of Claim 27 wherein:

said sensor provides information on one or more gas levels in an exhaust stream; and

said feedback control unit adjusts the frequency based on the gas level information.

40. (previously presented) The combustion apparatus of Claim 27 wherein:

said sensor provides information on temperature in the exhaust stream; and

said feedback control unit adjusts the frequency based on the temperature information.

41. (previously presented) The combustion apparatus of Claim 27 wherein said feedback control unit adjusts the frequency based on a comparison of at least one current operating parameter to a previously-recorded operating parameter.

42. (original) A combustion apparatus comprising:

a combustion chamber for containing a combustion reaction;

an intake for feeding a combustion material into said combustion chamber;

a nuclear magnetic resonance stimulation source which stimulates one or more components of the combustion material while in said intake before the combustion reaction to increase the oxidation of one or more selected components of the combustion reaction, said nuclear magnetic resonance stimulation source being sufficiently close to said combustion chamber such that travel time of the stimulated combustion material is less than a resonance relaxation time of the one or more selected components.

43. (original) The combustion apparatus of Claim 42 wherein said nuclear magnetic resonance stimulation source emits an electromagnetic signal having a frequency which targets a nuclear resonance frequency of hydrogen-1 in the combustion material.

44. (original) The combustion apparatus of Claim 42 wherein said nuclear magnetic resonance stimulation source emits an electromagnetic pulse which is synchronized with the combustion reaction.

45. (original) The combustion apparatus of Claim 42, further comprising:

at least one sensor which senses one or more operating parameters of the combustion reaction; and

a feedback control unit which adjusts said nuclear magnetic resonance stimulation source based on sensed operating parameters.

46. (original) A combustion apparatus comprising:

a combustion chamber for containing a combustion reaction of a combustion material; and

a nuclear quadrupole resonance stimulation source which stimulates one or more components of the combustion material while in said combustion chamber during the combustion reaction to reduce the oxidation of one or more selected components of the combustion reaction.

47. (original) The combustion apparatus of Claim 46 wherein said nuclear quadrupole resonance stimulation source emits an electromagnetic signal having a frequency which targets a nuclear resonance frequency of nitrogen-14 in the combustion material.

48. (original) The combustion apparatus of Claim 46 wherein said nuclear quadrupole resonance stimulation source emits an electromagnetic pulse which is synchronized with the combustion reaction.

49. (original) The combustion apparatus of Claim 46, further comprising:

at least one sensor which senses one or more operating parameters of the combustion reaction; and

a feedback control unit which adjusts said nuclear magnetic quadrupole stimulation source based on sensed operating parameters.

50. (withdrawn) A combustion apparatus comprising:

a combustion chamber for containing a combustion reaction of a combustion material; and

an exhaust port for carrying an exhaust stream away from said combustion chamber; and

a nuclear quadrupole resonance stimulation source which stimulates one or more components of the combustion material in the exhaust stream after the combustion reaction to reduce the oxidation of one or more selected components of the combustion reaction.

51. (withdrawn) The combustion apparatus of Claim 50 wherein said nuclear quadrupole resonance stimulation source emits an electromagnetic signal having a frequency which targets a nuclear resonance frequency of nitrogen-14 in the combustion material.

52. (withdrawn) The combustion apparatus of Claim 50 wherein said nuclear quadrupole resonance stimulation source emits an electromagnetic pulse which is synchronized with the combustion reaction.

53. (withdrawn) The combustion apparatus of Claim 50, further comprising:

at least one sensor which senses one or more operating parameters of the combustion reaction; and

a feedback control unit which adjusts said nuclear magnetic quadrupole stimulation source based on sensed operating parameters.

54. (previously presented) A feedback control unit for a nuclear resonance stimulation source which enhances a combustion reaction, comprising:

one or more inputs for receiving sensory data relating to the combustion reaction;

control logic which examines the sensory data to determine an operational adjustment factor for a frequency of the nuclear resonance stimulation source targeted for one or more selected components of the combustion reaction; and

an output which provides a signal indicative of the operational adjustment factor.

55. (canceled)

56. (previously presented) The feedback control unit of Claim 54 further comprising a user interface which allows the frequency to be programmably set.

57. (original) The feedback control unit of Claim 56 wherein said user interface further allows a frequency adjustment value to be programmably set.

58. (previously presented) The feedback control unit of Claim 54 wherein the sensory data relates to information on one or more gas levels in an exhaust stream, and said control logic adjusts the frequency based on the gas level information.

59. (previously presented) The feedback control unit of Claim 54 wherein the sensory data relates to information on temperature in an exhaust stream, and said control logic adjusts the frequency based on the temperature information.

60. (previously presented) The feedback control unit of Claim 54 wherein said control logic adjusts the frequency based on a comparison of current sensory data to previously-recorded sensory data.

61. (new) The method of Claim 1 where the nuclear resonance stimulation frequency is a first frequency targeted for a first one of the selected components, and said

stimulating further simultaneously uses nuclear resonance stimulation having a second frequency targeted for a second one of the selected components.

62. (new) The combustion apparatus of Claim 27 where the nuclear resonance stimulation source frequency is a first frequency targeted for a first one of the selected components, and said nuclear resonance stimulation source further simultaneously has a second nuclear resonance stimulation source frequency targeted for a second one of the selected components.